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HENRY M. BEISNER
11904 TILDENWOOD DRIVE
ROCKVILLE, MD 20852

EXAMINER	
ANDREA, BRIAN K	

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 21

Application Number: 09/847,093
Filing Date: May 02, 2001
Appellant(s): BEISNER, HENRY MICHAELS

EXAMINER'S ANSWER

This is in response to the appeal brief filed February 9, 2004

EXAMINER'S ANSWER

The Appellant's brief did not contain a statement of the real party in interest, a statement of related appeals and interferences, a status of the claims, a status of the amendments, a summary of the invention, a summary of the invention, or a grouping of the claims. However, because a registered practitioner does not represent Appellant, 37 CFR 1.192 (c) states that he is not required to provide these items in his brief. Therefore, the Examiner will attempt to provide each section below.

Real Party in Interest

The brief does not contain a statement identifying the Real Party in Interest. Therefore, it is presumed that the party named in the caption of the brief is the Real Party in Interest, i.e., the owner at the time the brief was filed. The Board, however, may exercise its discretion to require an explicit statement as to the Real Party in Interest.

Related Appeals and Interferences

The brief does not contain a statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief. Therefore, it is presumed that there are none. The Board, however, may exercise its discretion to require an explicit statement as to the existence of any related appeals and interferences.

Status of Claims

No statement of the status of the claims is contained in the Appellant's brief. A correct statement of the status of the claims is as follows:

This appeal involves claims 8-13. Claims 1-7 were cancelled in paper #5, a pre-amendment filed December 4, 2001.

Status of Amendments

No statement of the status of amendments is contained in the Appellant's brief however the Examiner submits that the original specification is being considered on appeal.

Summary of the Invention

No summary of the invention is contained in the brief. The Examiner cannot provide a summary of the invention because the specification is incomprehensible which is the reasoning for the objection under 37 CFR 1.71.

Issues

The appellant did not include a statement of the issues in the brief. The issues on appeal, as understood by the Examiner from the appeal brief, are:

The objection to the specification under 37 CFR 1.71.

The rejection of the claims under 35 U.S.C. 112, second paragraph.

Appellant's brief presents arguments relating to the new matter rejection made in the Office action dated March 14, 2003. This issue is no longer applicable because the specification submitted which was rejected because of the presentation of new matter is not being considered on appeal.

Grouping of Claims

The rejection of claims 8-13 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

Claims Appealed

No copy of the appealed claims are contained in an Appendix to the brief. A copy of the appealed claims are submitted as an appendix to this Examiner's Answer.

References of Record

No prior art is relied upon by the examiner in the rejection of the claims under appeal.

Grounds of Rejection

The disclosure is objected to under 37 CFR 1.71, as being so incomprehensible as to preclude a reasonable search of the prior art by the examiner. This objection is

set forth in prior Office Action, Paper No. 6. For example, the following items are not understood:

It is unclear exactly how the present invention may be made or used. The Detailed Description is insufficient in providing an adequate disclosure of the present invention. For example, an application of filter weights is discussed on page 4, paragraph 4 but no discussion of how the filter weights are calculated and how they are applied is provided. It is stated that the present invention "removes the multipath noise from the received signal" on page 4, paragraph 5 but it is unclear where the discussion of the removal of the multipath is discussed. Paragraph 6 appears to describe the receiving and sampling of the signal but it is unclear how this removes the multipath from the signal or why it is important in the present invention. Pages 5 and 6 provide equations that appear to teach how the multipath is removed but it is difficult to understand how and why these equations are applied without a written description as to their relation to the present invention.

Claims 8-13 are rejected under 35 U.S.C. 112, second paragraph. This rejection is set forth in prior Office Action, Paper No. 6.

The claims are generally read in light of the specification and in this case, the specification is needed to interpret the claims. Because the specification is incomprehensible, the claims are therefore unclear.

For example, in claim 8, language such as "a whitening filter with complex coefficients . . . and an array of complex delay-Doppler shift coefficients, . . . producing a residual . . ." require an understanding of the specification to be understandable.

While language such as "a communication system comprising a radio transmitter transmitting a signal which is interfered with by fixed reflectors and moving reflectors, said system comprising an antenna, a receiver and a multipath reduction subsystem comprising an analog to digital converter, a real to complex converter . . ." is understood, any language which must be read in light of the specification is incomprehensible because the specification is incomprehensible.

Response to Argument

The Applicant, on page 2 of the appeal brief filed February 09, 2004, argues that the examiner's original objection to the specification was improper and that, "if you can understand the contents of [the book by Monson H. Hayes submitted with the arguments], you can understand the original application." Specifically, Applicant has argued that "the examiner had trouble understanding the process of converting the signal from analog to complex digital samples" (in the second paragraph on page 2); that "the examiner does not understand the rudiments of digital filters" (third paragraph on page 2); and that "if the examiner was familiar with the contents of Hayes, that is, had ordinary skill in the art of digital signal processing, he should have had no difficulty understanding the original application."

In response, the original objection by the Examiner stated that the following items were not understood in the specification:

(1). Calculation and application of the filter weights used in the filter; and

(2). How the removal of multipath is accomplished using the filter of the present invention.

This objection was not based on the fact that elements such as "analog to digital processing" or "digital filtering are not understood. The objection to the specification was made because, while each individual element is easity understood by someone of ordinary skill in the art, the application and synthesis of each element of processing in the present invention is not readily understood from the disclosure provided by the Applicant. For example, it is understood how the filter weights are calculated but it is not understood how they are applied to remove the multipath from the received signal. The use of filters is well known in the art and it is understood that filtering is used for removing the multipath from the received signal in the present invention. However, this is not enough to fully disclose the workings of the invention. It must be understood how each element of the filtering process is used in the present application and how each element works with other elements to accomplish the removal of multipath from the signal.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

BKA

BKA
March 26, 2004

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THT

TGB

HENRY M. BEISNER
11904 TILDENWOOD DRIVE
ROCKVILLE, MD 20852

APPENDIX

What is claimed is:

8. A communication system comprising a radio transmitter transmitting a signal which is interfered with by fixed reflectors and moving reflectors, said system comprising an antenna, a receiver and a multipath reduction subsystem comprising an analog to digital converter, a real to complex converter, a whitening filter with complex coefficients and a multipath canceller comprising an array of complex delay-Doppler shift coefficients, delayers of one sample and shifters of one frequency increment, said array producing a residual from which the interferences from said fixed reflectors and said moving reflectors have been removed, said multipath canceller comprising a minimizer minimizing the mean square of said residual over the said whitening filter coefficients and the said multipath canceller delay-Doppler coefficients, said subsystem comprising a spectrum restoring filter utilizing the said whitening filter coefficients restoring said original signal.

9. A multipath-reduction subsystem for use in a communication system comprising a radio transmitter transmitting a signal which is interfered with by fixed reflectors and moving reflectors, said system comprising an antenna, a receiver and said multipath reduction subsystem comprising an analog to digital converter, a real to complex converter, a whitening filter with complex coefficients and a multipath canceller comprising an array of complex delay-Doppler shift coefficients, delayers of one sample and shifters of one frequency increment, said array producing a residual from which the interferences from said fixed reflectors and said moving reflectors have been removed, said multipath canceller comprising a minimizer minimizing the mean square of said residual over the said whitening filter coefficients and the said multipath canceller delay-Doppler coefficients, said subsystem comprising a spectrum restoring filter utilizing the said whitening filter coefficients restoring said original signal.

10. A multipath reduction method for use in a communication system comprising a radio transmitter transmitting a signal which is interfered with by fixed reflectors and moving reflectors, said system comprising an antenna, a receiver and an analog to digital converter, said multipath reduction method comprising reducing multipath by converting real sampled data to complex sampled data, whitening said complex sampled data by filtering with complex coefficients and cancelling said multipath by delaying and frequency shifting the residual under control of the complex delay-Doppler shift coefficients producing said residual from which the interferences from said fixed reflectors and said moving reflectors have been removed, said whitening filtering coefficients and said multipath cancelling delay-Doppler shift coefficients being determined by minimizing the mean square of said residual, said multipath reduction method comprising restoring the spectrum of said signal by filtering utilizing the said whitening filtering coefficients to restore said signal.

11. A surveillance system with targets which are moving reflectors, with interfering fixed reflectors and with interfering moving reflectors, said system comprising one or more stationary or moving transmitters, one or more stationary or moving antennas, one or more receivers and a surveillance subsystem comprising a multipath reduction subsystem for each receiver, said multipath reduction subsystem comprising an analog to digital converter, a real to complex converter, a whitening filter with complex coefficients and a multipath canceller comprising an array of complex delay-Doppler shift coefficients, delayers of one sample and shifters of one frequency increment, said array producing a residual from which the interferences from said fixed reflectors, said moving reflectors and said targets have been removed, said multipath canceller comprising a minimizer minimizing the mean square of said residual over the said whitening filter coefficients and the said multipath canceller delay-Doppler coefficients, said surveillance subsystem comprising, for each receiver, a target measurer giving differential range and differential range rate from said delay-Doppler coefficients, said target measurer, if more than one antenna is provided, giving target angle from the relative phases of said complex delay-Doppler coefficients, said surveillance subsystem comprising a target tracker utilizing the said measured differential range, said differential range rate, said angle and the position and velocity of the platform on whieh said antennas are mounted, said position and said velocity being determined by a navigation subsystem, said tracker locating and tracking said target or targets.

12. A surveillance subsystem for use in a surveillance system with targets which are moving reflectors, with interfering fixed reflectors and with interfering moving reflectors, said system comprising one or more stationary or moving transmitters, one or more stationary or moving antennas and one or more receivers, said surveillance subsystem comprising a multipath reduction subsystem for each receiver, said multipath reduction subsystem comprising an analog to digital converter, a real to complex converter, a whitening filter with complex coefficients and a multipath canceller comprising an array of complex delay-Doppler shift coefficients, delayers of one sample and shifters of one frequency increment, said array producing a residual from which the interferences from said fixed reflectors, said moving reflectors and said targets have been removed, said multipath canceller comprising a minimizer minimizing the mean square of said residual over the said whitening filter coefficients and the said multipath canceller delay-Doppler coefficients, said surveillance subsystem comprising, for each receiver, a target measurer giving differential range and differential range rate from said delay-Doppler coefficients, said target measurer, if more than one antenna is provided, giving target angle from the relative phases of said complex delay-Doppler coefficients, said surveillance subsystem comprising a target tracker utilizing the said measured differential range, said differential range rate, said angle and the position and velocity of the platform on which said antennas are mounted, said position and said velocity being determined by a navigation subsystem, said tracker locating and tracking said target or targets.

13. A surveillance method for use in a surveillance system with targets which are moving reflectors, with interfering fixed reflectors and with interfering moving reflectors, said system comprising one or more stationary or moving transmitters, one or more stationary or moving antennas, one or more receivers each with an analog to digital converter, said surveillance method comprising reducing multipath for each receiver, by converting real sampled data to complex sampled data, whitening said complex sampled data by filtering with complex coefficients and cancelling said multipath by delaying and frequency shifting the residual under control of the complex delay-Doppler shift coefficients producing said residual from which the interferences from said fixed reflectors, said moving reflectors and said targets have been removed, said whitening filtering coefficients and said multipath cancelling delay-Doppler shift coefficients being determined by minimizing the mean square of said residual, said surveillance method comprising, for each receiver, measuring said target or targets by obtaining differential range and differential range rate from said delay-Doppler shift coefficients, and if more than one antenna is provided, obtaining target angle from the relative phases of said complex delay-Doppler shift coefficients, said surveillance method comprising locating and tracking said target or targets utilizing the said measured differential range, said differential range rate, said angle and the position and velocity of the platform on which said antennas are mounted, said position and said velocity being determined by a navigation subsystem.